Gyrostemon osmus Halford (Gyrostemonaceae), a new species from south-eastern Queensland

D.A. Halford

Summary

Halford, D.A. (2005). *Gyrostemon osmus* Halford (Gyrostemonaceae), a new species from south-eastern Queensland. *Austrobaileya* 7(1): 135–139. *Gyrostemon osmus* Halford is described, illustrated and diagnosed against related species. Notes on habitat and distribution are provided. A new section, *G.* sect. *Monoecia* Halford is proposed to accommodate the new species.

Key Words: Gyrostemonaceae, *Gyrostemon*, *Gyrostemon osmus*, *Gyrostemon* section *Monoecia*, Queensland, Australian flora

D.A. Halford, c/- Queensland Herbarium, Environmental Protection Agency, Brisbane Botanic Gardens, Mt Coot-tha Road, Toowong, Queensland 4066, Australia

Introduction

Gyrostemon Desf. is a genus of dioecious shrubs and small trees distributed throughout southern and arid Australia. In George's (1982) *Flora of Australia* treatment of the genus, he recognised a total of twelve species, eight of which are endemic in Western Australia. Until now two species *G. ramulosus* Desf. and *G. tepperi* (F.Muell. ex H Walter) A.S.George were recorded for Queensland, from the far west of the State.

The species described here as *G. osmus* was first brought to my attention in May 2004 when a specimen was sent to the Queensland Herbarium for identification. The specimen was initially misidentified as *Codonocarpus attenuatus* (Hook.) H.Walter. The habit and broad flat leaf lamina of *G. osmus* gives this species a superficial resemblance to *Codonocarpus attenuatus*. However, *G. osmus* has fruiting carpels that dehisce along the midline of the dorsal surface, a character that distinguishes the genus *Gyrostemon* from *Codonocarpus* which has fruiting carpels that dehisce along the ventral surface.

Taxonomy

Gyrostemon osmus Halford, **sp. nov.** ut videtur maxime arcte affinis *G. racimigero* autem planta monoecia foliis grandioribus 6–20 × 0.7–3 cm (vice 1–5 × c. 0.2 cm) praedita, floribus maribus 13–15 staminibus in verticillum unum dispositis (vice 45–50 staminibus in 4–5 series dispositis), floribus femineis in pedicellis 2–3 mm longis (comparitis ad flores femineos in pedicellis 2–3 mm longis), stigmatibus 2.5 mm longis, ± linearibus (vice 1–1.5 mm longis aliquantum petaloideis) differt. **Typus:** Queensland. Moreton District: Pages Pinnacle, *c.* 10 km WSW of Mudgeeraba, 11 January 2005, *D. Halford Q8348* (holo: BRI; iso: AD, DNA, MEL, MO, NSW, PERTH *distribuendi*).

Monoecious, short-lived perennial subshrub to 2.5 m high, single-stemmed or much branched near ground. Branches hollow, stout, ± terete, stiffly erect with few lateral branchlets, glabrous, sparsely papillose when young becoming smooth with age, green to yellowish orange becoming orange to reddish orange in colour with age, no cork development. Stipules triangular, 0.2–0.7 mm long, acute. Leaves ± sessile, spirally alternate, spreading, discolorous; lamina flat, thin, lanceolate or very narrowly elliptic-ovate, 6–20 cm long, 0.7–3 cm wide, glabrous and smooth except for scattered protuberances on margins and along mid and lateral veins; base cuneate; apex attenuate; midvein slightly raised on adaxial surface, prominent on abaxial surface; lateral veins widely spaced, *c.* 70° to midvein. Inflorescences racemose, axillary, with 1–20 female flowers basal on the axis and 1–60 males flowers distal

Accepted for publication 18 July 2005

to them; axis 0.8 to 10 cm long, papillose; bracts linear-lanceolate 1.5–3.5 mm long, pale brown. Male flowers on pedicels 1–2.7 mm long; calyx cupular, *c.* 2 mm across, green, divided to *c.* 1/3 into 7 or 8 lobes; lobes broadly triangular, acute at apex; stamens 12–15 in 1 whorl; filaments to 0.2 mm long, stout; anthers ± obloid-clavate, 1.8–2.2 mm long, rounded to retuse at apex, 2-locular, dehiscing by lateral longitudinal slits; rudimentary carpels present around central disc; disc *c.* 0.8 mm diameter, flat or slightly convex, ± smooth. Female flowers sessile or shortly pedicellate; pedicels to 0.6 mm long; calyx persistent, cupular, *c.* 1.5 mm across, green, divided $^1/_3$ to ½ into 5–8 lobes; lobes ± triangular, obtuse to acute at apex; androecium obsolete; carpels 10–12, free, attached around central column; ovule 1 per carpel, attached near centre of column; stigmas as many as carpels, spreading at anthesis, marcescent, shortly connate at base, ± linear, 2.5–4 mm long, ± tetragonous in transverse section, glabrous, longitudinally sulcate on adaxial surface, tuberculate on abaxial surface; central column expanded at top into disc; disc 0.4–0.5 mm across, tuberculate. Fruits depressed globose, 3–5 mm long, 6–9 mm across; fruiting carpels laterally compressed, reniform, scarious, ± inflated, ± smooth and rounded on dorsal surface, dehiscing along longitudinal midline of dorsal surface into 2 segments which readily separate from the persistent central column. Seeds ± comma-shaped in lateral view, 1.7–2 mm long, dark brown, transversely rugose; aril white, enclosing base of seed. **Fig. 1 & 2**.

Additional specimens examined: **Queensland.** Moreton District: Pages Pinnacle, May 2004, *Halford Q8232* (BRI); Pages Pinnacle, *c.* 100 m SE of summit, 9.5 km WSW of Mudgeeraba, Apr 2004, *O'Donnell 1* (BRI).

***Distribution and habitat*:** *Gyrostemon osmus* is endemic in south-eastern Queensland, where it is currently known from the type locality on Pages Pinnacle west of Mudgeeraba. It grows in a tall open heath on narrow ledges and steep slopes of a razorback ridge on shallow well-drained greyish loam soils derived from rhyolite. Associated plants include *Allocasuarina littoralis*, *Leptospermum microcarpum*, *Lepidosperma laterale*, *Xanthorrhoea latifolia* subsp. *latifolia*, *Dendrobium kingianum* and *Platysace lanceolata.*

***Phenology*:** Flowers have been recorded from January, April and May.

***Affinities*:** In George's (1982) keys to the species of *Gyrostemon*, *G. osmus* will key to *G. tepperi* in the key based on male plants and to *G. racemiger* in the key based on female plants. A comparison of diagnostic differences between *G. osmus*, *G. tepperi* and *G. racemiger* is provided in **Table 1**.

Gyrostemon osmus is unique within *Gyrostemon* and is easily distinguished from all other species by the following combination of characters: plants monoecious; leaf lamina flat and thin, 0.7–3 cm wide; flowers in axillary racemes; 12–15 stamens in single whorl; female flowers sessile or with pedicel to 0.6 mm long; 10–12 carpels per flower; fruits depressed globose with fruiting carpels not thickened along midline of dorsal surface; stems without corky bark.

Some may consider these morphological differences sufficient to warrant the recognition of a new genus. However, I feel it would be premature to do so in the absence of more complete knowledge of the variation within the genus. George (2003) indicates that there are several inadequately known taxa of *Gyrostemon* in Western Australia.

Keighery (1985) recognised two sections within *Gyrostemon* namely, *G.* sect. *Gyrostemon* and *G.* sect. *Didymotheca* (Hook.f) Keighery. These sections were based on the number of staminal whorls and number of carpels. *Gyrostemon osmus* does not fit into either of the sections as circumscribed by Keighery. The attributes of a single whorl of stamens and 10–12 carpels, together with plants monoecious, and leaf laminae thin and flat, warrant the segregation of *G. osmus* to a new section within *Gyrostemon*. I here describe *Gyrostemon* sect. *Monoecia* to accommodate *G. osmus*. The differences between the three sections of *Gyrostemon* are set out in **Table 2**.

Gyrostemon sect. **Monoecia** Halford **sectio nova.** A *Gyrostemone* sect. *Gyrostemone* et *G.* sect. *Didymotheca* differt plantis monoeciis, foliis teneris plus minusve planis (in illis plantae dioeciae, foliis crassis pro parte maxima filiformibus usque teretibus) etiam a sect. *Gyrostemone* verticillo unico staminum (in illo

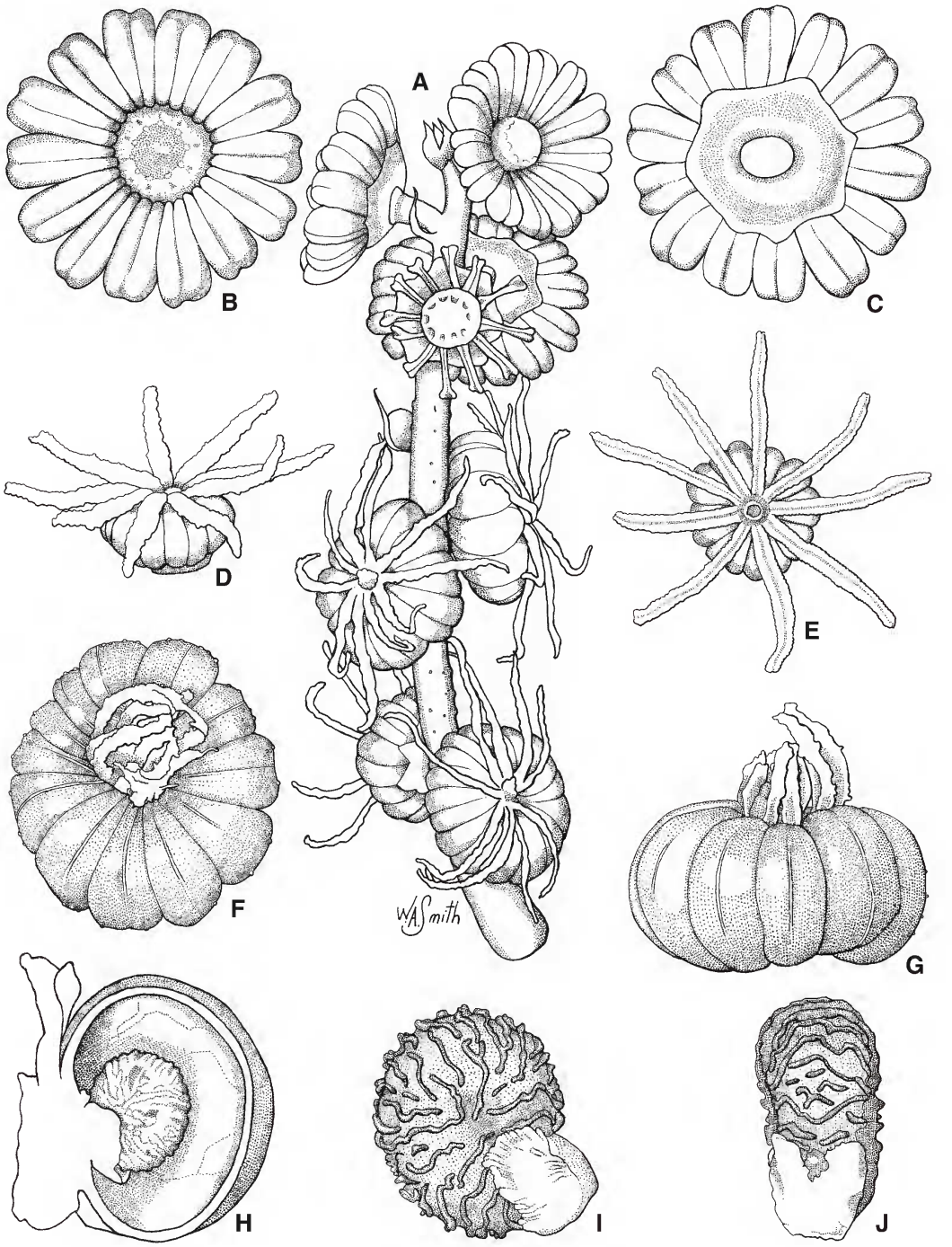

Fig. 1. ***Gyrostemon osmus.*** A. inflorescence with male and female flowers ×6. B. male flower viewed from above ×8. C. male flower viewed from below ×8. D. female flower viewed from side ×8. E. female flower viewed from above ×8. F. fruit viewed from above ×6. G. lateral view of fruit ×6. H. lateral cross section of fruit showing seed attachment ×10. I. lateral view of seed ×16. J. ventral view of seed ×16. All from *Halford Q8232* (BRI). Del. W. Smith.

Table 1. Morphological comparison of *Gyrostemon osmus*, *G. tepperi* and *G. racemiger*.

Character	*G. osmus*	*G. tepperi*	*G. racemiger*
breeding system	monoecious	dioecious	dioecious
leaf lamina shape	flat, lanceolate or very narrowly elliptic ovate	linear-terete	linear-terete
leaf lamina dimensions	6-20 × 0.7-3 cm	0.5-3 × c. 0.1 cm	1-5 × c. 0.2 cm
male flowers per raceme	up to 50	1-3	up to 14
no. of staminal whorls	1	1	4-5
stamen number	12-15	7-10	45-60
female flowers per raceme	up to 20	solitary or up to 3	up to 8
female flower pedicel length	obsolete or up to 0.6 mm	1-2 mm	2-3 mm
carpel number	10-12	1 or 2	10-18 or more
stigma length	2.5-4 mm	*c.* 1 mm	1-1.5 mm
stigma shape	± linear	petaloid	± petaloid
aril	enclosing base of seed	almost enclosing whole seed	enclosing up to ½ of the seed

duobus usque aliquot) et a sect. *Didymotheca* carpellis 10–12 (in illo 1–4) differt. **Typus**: *G. osmus* Halford.

***Conservation status*:** *Gyrostemon osmus* is currently known only from the type locality. Pages Pinnacle is not within a conservation reserve; however, it is in an area set aside as part of the Water Catchment area for the Hinze Dam. The population has been observed to fluctuate dramatically with as few as 5 individuals in August 2004 to approximately 1000 plants in January 2005. The increase in population size was in response to a fire that burnt through the habitat in October 2004. Preliminary field observations indicate *G. osmus* has a soil-stored seedbank, the germination of which appears to be induced by fire.

This species fulfils the criteria of "Critically Endangered" under the IUCN (2001) categories (CR B1ac(iv); B2ac(iv)). Further searches of likely habitat are required in south-eastern Queensland and northern New South Wales.

***Etymology*:** The specific epithet is derived from the Greek *osme* meaning 'odor, smell'; in reference to the faint pungent odor which emanates from the plant when crushed.

Acknowledgements

I am grateful to Will Smith for the excellent illustration, Peter Bostock for the photograph used in Fig. 2 and the translation of the diagnosis of *G.* sect. *Monoecia* into Latin, Les Pedley for the translation of the diagnosis of *G. osmus* into Latin and Gordon Guymer, Director of BRI, for

Table 2. Morphological comparison of *Gyrostemon* sect. *Gyrostemon*, *G.* sect. *Didymotheca* and *G.* sect. *Monoecia*

Character	*G.* sect. *Gyrostemon*	*G.* sect. *Didymotheca*	*G.* sect. *Monoecia*
breeding system	dioecious	dioecious	monoecious
leaf texture	thick	thick	thin
leaf shape	filiform to linear-terete	narrowly lanceolate, narrowly obovate, linear to linear-terete	lanceolate or very narrowly elliptic-ovate
Number of staminal whorls	2-numerous	1	1
Number of stamens	11-100	7-14	12-15
Number of carpels	2-30	1-4	10-12

assistance in the field and for making available working space and facilities at BRI. An anonymous referee is thanked for useful comments.

References

George, A.S. (1982). *Gyrostemonaceae. Flora of Australia* 8: 362–378. Australian Biological Resources Study/CSIRO Publishing: Melbourne.

George, A.S. (2003). *Gyrostemonaceae*. In Kubitzki (ed.), *The Families and Genera of Vascular Plants* 5: 213–217. Springer-Verlag: Berlin, Heidelberg.

Iucn (2001). *IUCN Red List Categories: version 3.1*. IUCN Species Survival Commission. IUCN: Gland, Switzerland.

Keighery, G.J. (1985). *Walteranthus*, a new genus of Gyrostemonaceae from Western Australia. *Botanische Jahrbücher für Systematik Pflanzengeschichte und Pflanzengeographie* 106: 107–113.

Fig. 2. *Gyrostemon osmus*. Branchlet with flowers and fruit. Photo: P.D. Bostock.